

Claims

- Sub
a1
1. A security device for use inside an automatic teller machine, the security unit (100) comprising coupling means (110,150) for engaging the device with a cash cassette of an automatic teller machine, spoiling means (130, 132) for spoiling the contents of the cassette and control means, in which monitoring means is provided to signal when the cash cassette has correctly coupled to the security device and that a delivery path for delivering the spoiling means has not been tampered with.
 2. A security device as claimed in claim 1, characterised in that the control means is arranged to establish communication with the automatic teller machine in order that an attack on the automatic teller machine can be signalled to the security device in order that it can operate the spoiling means to spoil the contents of the cash cassette.
 3. A security device as claimed in any one of the preceding claims, characterised in that the security device is arranged to signal to the automatic teller machine when it has correctly coupled with the cash cassette and has taken over responsibility for protecting the contents of the cassette.
 4. A security device as claimed in any one of the preceding claims, characterised in that the spoiling means comprises a reservoir of ink which can be ejected under pressure via a fluid flow coupling (138,140,130,112, 114, 116, 118) into the cash cassette to the degrade the contents thereof.
 5. A security device as claimed in any one of the preceding claims, characterised in that the reservoir and the control means are contained within an enclosure containing penetration detection means.

6. A security device as claimed in claim 5, characterised in that the penetration detection means comprises at least one conductor arranged to traverse an element that is to be monitored for penetration, such that penetration of the element causes damage to the at least one conductor thereby altering its electrical properties.
7. A security system comprising locking means (6) for locking the security system (6, 8, 12; 100,102) onto a portable container (4) to be protected during transportation, spoiling means (10; 130,132) for spoiling the contents of the container (4) in the event of an attack and control means (10) for controlling operation of the locking means and spoiling means.
8. A security system as claimed in claim 7, characterised in that the locking means (6) locks around one of an opening of the container (4) or an adapter mounted on the container (4).
9. A security system as claimed in claim 7 or 8, characterised by a first module (8, 10) containing the control means and a second module (6) containing the locking mechanism, and in which the spoiling means is contained within one of the first and second modules.
10. A security system as claimed in any one of claims 7 to 9, characterised in that the control module includes communication means for exchanging data with other security systems, such that a first of the security systems can validate that the second one of the systems is protecting the container before the first one releases responsibility.

11. A security system as claimed in any one of claims 7 to 10, characterised in that the control module includes a local memory and power supply and at least one sensor.
12. A security system as claimed in claim 11, characterised in that the local memory is programmed with the identity of the or each automatic teller machine which is scheduled for a cash delivery within a predetermined time period.
13. A security system as claimed in any one of claims 7 to 12, further comprising a delivery vehicle including a controller which controls the release of cash cassettes from the delivery vehicle and which exchanges data with the control means (10).
14. A security system as claimed in claim 11, characterised in that the control module is arranged to measure at least one of walk time, distance travelled, and absolute time since release and to activate the spoiling mechanism if any of these exceeds an associated threshold.
15. A security system as claimed in claim 10, characterised in that the control means is arranged to communicate with an automatic teller machine to validate identities, to exchange data concerning the value and/or denomination of money being transferred to or from the security system and the automatic teller machine.
16. A security system as claimed in claim 10, characterised in that the control means is arranged to pass encryption or decryption keys to an automatic teller machine.

17. A security system as claimed in claim 11, characterised in that the control module includes at least one of an accelerometer, compass, inertial guidance system and temperature sensor so as to detect if the container (4) is being moved in an inappropriate direction or if an attempt is being made to defeat the security system using a hot torch or extreme cold.

18. A security system as claimed in claim 7, characterised in that the spoiling mechanism includes at least one dye reservoir for delivering dye, and one of a compressed gas cylinder (130), a chemical delivery system for generating gas, and explosive delivery system or a mechanical system for causing the dye to be expelled from the at least one reservoir.

19. A security container, comprising:

- 1) an enclosure (12) for defining a protected volume, said enclosure having an opening;
- 2) a removable closure (6) for sealing the opening in the enclosure; and
- 3) a protective element (8) protecting the removable closure (6) from attack and arranged, in use, to act as a sacrificial element in the event of an attack on the security container in order to enable a spoiling apparatus located in one of the enclosure (12), the removable closure (6) or the protective element (8) to operate.

20. A security container as claimed in claim 19, characterised in that the removable closure is arranged to selectively lock onto one or more of the following:

- 1) a container (4);
- 2) the enclosure (12);

002299-992299

- 3) the protective element (8); and
- 4) an external locking apparatus.

21. A security container as claimed in claim 20, characterised in that the removable closure is formed by an interface element (6).

22. A security container as claimed in claim 21, characterised in that the container (4) is a cash cassette for an automatic teller machine, the cassette is carried inside the enclosure and the interface element locks to the cash cassette and the enclosure.

23. A security container as claimed in any one of claims 19, 20, 21 and 22, characterised in that the protective element (8) is a hood which, in use, covers the removable closure and extends partially along the length of the enclosure (12), and which selectively locks to the removable closure.

24. A security container as claimed in any one of claims 19 to 23, characterised in that at least one of the enclosure (12) and protective element (8) includes means for detecting physical penetration thereof.

25. A security container as claimed in claim 24, characterised in that the penetration detecting means comprises one or more conductors (250) arranged adjacent one another such that the conductors become damaged when an object passes through an element including them.

26. A removable closure for a security container (2), the closure (6) characterised by comprising locking means for locking to at least one of the following:

1. a container (4) which encloses a volume to be protected;
 2. an enclosure (12) for protecting a volume to be protected, which volume may enclose the container (4) mentioned hereinabove;
 3. a protective cover (8); and, optionally,
 4. an external locking apparatus.
27. A removable closure as claimed in claim 26, characterised in that the locking means is provided with a plurality of movable engagement elements (68, 74, 88) movable between locking and unlocking positions.
28. A removable closure as claimed in claim 27, characterised in that engagement elements (68, 74, 88) are individually controllable.
29. A removable closure as claimed in claim 27 characterised in that the engagement elements (68, 74, 88) are controlled by respective cams mounted for rotation in response to rotation of a common shaft.
30. A removable closure as claimed in claims 27 or 29, characterised in that the locking means follows a set sequence and in turn locks onto other parts of a security system as follows:
1. all engagement elements withdrawn;
 2. locks onto a control unit (8) only;
 3. locks onto the control unit (8), and a cassette (4);
 4. locks onto control unit (8), cassette (4) and a sleeve (12);

5. locks onto the control unit (8), cassette (4), sleeve (12) and rack;
 6. locks onto cassette (4), sleeve (12) and rack.
31. A removable closure as claimed in any one of claims 26 to 30, characterised in that the locking means is provided as an interface card.
32. A removable closure as claimed in claim 27, characterised in that the engagement means are slidable bolts.
33. A removable closure as claimed in claim 30, in which a protective element is locked onto the locking means at positions 2, 3, 4 and 5.
34. A removable closure as claimed in claim 31, characterised in that the control unit includes a drive device for driving the interface card between the various positions.
35. A removable closure as claimed in claim 31, characterised in that the interface card has an input shaft for causing motion of the movable engagement elements, and the input shaft is protected against malicious or inadvertent rotation by a mechanical interlock.
36. A removable closure as claimed in claim 35, characterised in that the interlock is in the form of a solenoid which must be actuated to release the input shaft to allow it to rotate.
37. A tamper resistant coupling for coupling an ink or dye based spoiling security system (130, 132) to a security container (4), characterised by the coupling comprising co-operating male and female connectors, the male connector comprising a hollow pipe (138) disposed within a movable sheath (150), the pipe (138) including at least one delivery aperture (140) arranged on the side thereof, such that as the male and female

components are coupled together, the pipe (138) extends into a recess in the female component and the end of the pipe (138) extends past the at least one delivery aperture in the female component.

38. A tamper resistant coupling as claimed in claim 37, characterised in that a monitoring device is arranged to monitor the relative motion between the pipe (138) and the sheath (150) of the male unit and to signal an error if the motion falls outside of an expected range.

39. A tamper resistant coupling as claimed in claim 37 or 38, characterised in that a latch is operated to secure the male and female units in place with respect to one another when they are properly coupled together.

40. A tamper resistant coupling as claimed in any one of claims 37 to 39, characterised in that a latch is arranged to hold a cash cassette (4) of an automatic teller machine at a first position which corresponds to the operating position of the cassette (4) within the automatic teller machine, but which latch also, when under duress, allows movement of the cassette (4) to a second position, said movement is detected by a sensor and is used to activate a spoiling mechanism which is still in fluid flow communication with the interior of the cassette.

41. A rack system for use in a cash in transit vehicle, characterised by the rack containing a plurality of attachment points for attaching a cassette and an interface card to the rack, a control system for controlling spoiling means for spoiling the contents of the cassette (4), wherein the spoiling means may be provided within the rack or may be attached to or provided in the interface cards.

1. The first part of the paper is devoted to a review of the literature on the topic. It starts with a general overview of the field, followed by a more detailed discussion of the specific issues at hand. The author then presents his own findings, which are based on a series of experiments. These findings are then compared with the results of previous studies, and the author discusses the implications of his work. Finally, the paper concludes with a summary of the main points and some suggestions for future research.

43. A rack system as claimed in claim 41 or 42, characterised in that the rack comprises a plurality of arms movable between operating positions at which they can act to secure the cash cassette (4) and non-operating positions at which the arms are folded away or retracted to release space to the interior of the vehicle.

44. A rack system as claimed in any one of claims 41 to 43, characterised in that the rack system includes a data communications link such that a security system used to protect the cassette whilst it is being carried from the cash in transit vehicle can exchange data with the cash in transit vehicle in order to determine the position of the vehicle or to exchange data such as the identity of the automatic teller machine which is to be filled, or security codes.

45. A rack system as claimed in any one of claims 41 to 44, characterised in that the rack system is arranged to release only one empty container and one security system for the container when the cash in transit vehicle arrives at an unloading point and that the cash cassettes (4) are not released until a dummy run to an automatic teller machine to be replenished has been completed.

46. An automatic teller machine characterised by a data exchange device for exchanging data with a security system for protecting a cash cassette (4) during delivery.

47. An automatic teller machine as claimed in claim 46, characterised in that the automatic teller machine is arranged to exchange data relating to at least one of security

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100
1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	

codes, identity codes, the value of money in a new cash cassette, value of money in an old cash cassette and encryption/decryption keys with the security system for protecting the cash cassette.

48. A marker for use in a spoiling apparatus, the marker characterised by comprising an ink or dye or including an additive that emits visible radiation.

49. A marker as claimed in claim 48, characterised in that the ink, dye or additive phosphoresces or fluoresces.

50. An apparatus for activating a spoiling mechanism, characterised by a first coil (186) connected to energise a spoiling mechanism, the first coil being mounted on a first member, and a second coil (182) connected to a power supply and mounted on a second member, and in which the first and second members are arranged such that relative motion between them causes the coils to approach and inductively couple to one another, thereby supplying power to the spoiling mechanism.

51. A method of manufacturing a tamper resistant panel or containers, characterised by comprising the steps of:

1. laying down a first layer of fibres;
2. laying down an array of sensing elements;
3. laying down a second layer of fibres; and
4. impregnating the layers with resin and allowing them to harden.

52. A method as claimed in claim 51, characterised in that the layers are placed in a mould.

53. A method of protecting the contents of an automatic teller machine whilst the automatic teller machine (ATM) is being serviced or repaired, comprising the steps of securing the cash cassettes of the ATM to a security system comprising locking means for locking the security system onto a container to be protected, spoiling means for spoiling the contents of the container in the event of an attack and control means for controlling operation of the locking means and spoiling means, and then removing the cash cassette(s) whilst the ATM is being serviced or repaired.

54. A method of protecting the contents of an automatic teller machine (ATM) whilst the ATM is being serviced or repaired, comprising the steps securing the cash cassette(s) of the ATM to a security container comprising:

1. an enclosure for defining a protected volume, said enclosure having an opening;
2. a removable closure for sealing the opening in the enclosure; and
3. a protective element protecting the removable closure from attack and arranged, in use, to act as a sacrificial element in the event of an attack on the security container in order to enable a spoiling apparatus located in one of the enclosure, removable closure or the protective element to operate.

55. A blast detector for detecting explosions, characterised by a resilient element (202) held in a first bowed state between opposed supports and a first side of the element being exposed to impinging pressure waves such that, in response to a pressure wave exceeding a predetermined magnitude, the element (202) assumes a second bowed state which is detected to signal to occurrence of a blast.

56. A blast detector as claimed in claim 55, characterised in that, in the second bowed state, the resilient element operates a switch or abuts at least one electrical contact so as to complete a circuit.
57. A delivery apparatus for a multi-component spoiling system, comprising at least first and second compartments separated from each other, and mixing means arranged to allow the contents of the compartments to mix in response to an increase in pressure in at least one of the compartments.
58. A delivery apparatus as claimed in claim 57, characterised in that the at least two compartments are collapsible reservoirs arranged to expel their contents via a common delivery path.
59. A delivery apparatus as claimed in claim 57, characterised in that the at least two compartments are arranged in series such that an increase in pressure within an Nth compartment above a threshold opens a fluid flow communication path with a N+1th compartment, and the final compartment is arranged to deliver a mixture of components via a delivery aperture which is arranged to open in response to pressure exceeding a predetermined threshold.
60. A delivery apparatus as claimed in claim 58 or 59, characterised by frangible regions which open when the pressure acting thereon exceeds a predetermined threshold.
61. A delivery apparatus as claimed in any one of claims 57 to 60, characterised by a gas reservoir for selectively applying compressed gas to one of the at least two compartments.

Add
C2

Add
E3

Add
F5